



FRD Activities Report April 2000



Research Programs

Central California Ozone Study (CCOS)

Preparations continue for deployment of eight meteorological towers and a ground-based remote profiling system for the upcoming Central California Ozone Study (CCOS). This four-month field study will begin on June 1, 2000 and end on September 30, 2000. These sites were surveyed by Tom Strong in a recent trip to California. The final locations of the eight meteorological towers are:

Station	ID	Lat (N)	Lon (W)	Elev (m)
Carrizo Plain	CAR	35° 23.75'	120° 05.12'	658
Piedras Blancas	PBL	35° 39.88'	121° 17.08'	5
McKittrick	MKT	35° 18.16'	119° 37.30'	390
Kettleman City	KET	36° 05.70'	119° 57.02'	103
Granite Bay	GRN	38° 44.23'	121° 12.01'	227
Suisun City	SUI	38° 13.21'	121° 50.81'	145
Point Reyes	REY	38° 05.74'	122° 56.89'	38
Shasta Lake	SHA	40° 41.37'	122° 24.14'	361
Bella Vista	BEL	40° 37.13'	122° 17.84'	190

Measurements from these towers include wind speed and wind direction, air temperature, and relative humidity. These data will be recorded as 5-min averages and will be transmitted back to FRD several times per day via phone lines for quality control (QC) screening and distribution to CCOS principle investigators. The 915-MHz radar wind profiler, radio acoustic sounding system (RASS), and Radian 600PA phased-array Doppler sodar will be deployed on the Carrizo Plain located in the California Valley. Wind profiles acquired by the radar and sodar will be acquired as one-hour averages while temperature profiles obtained from the RASS will be reported once per hour as 5-min averages. These data will also be transmitted to FRD for QC screening and availability to the CCOS community. The CCOS team will depart Idaho Falls on Monday, May 15 to begin deploying these measurement systems. (Jerry.Crescenti@noaa.gov, Randy Johnson, Tom Strong, Shane Beard)

VTMX-CBNP 2000

Initial funding has been received to begin preparations for the Vertical Transport and Mixing Experiment-Chemical and Biological Nonproliferation Program (VTMX-CBNP 2000). The study will be conducted in Salt Lake City UT, in October 2000. Participants include several DOE national laboratories and a handful of universities. The VTMX portion of the experiment will concentrate on regional scales of transport and mixing. This is the portion that ATDD will be participating in (see next paragraph). The CBNP portion of the study is leveraging equipment and tracers already dedicated to VTMX, but will concentrate on building to urban scales of transport and mixing. It is in the CBNP portion of the study that FRD will participate. Plans call for FRD to provide: 1) a radar profiler, RASS and Doppler sodar, 2) 60 whole air samplers for SF₆ sampling, 3) 40 modified whole air samplers to accommodate perfluorocarbon and SF₆ tracer sampling, 4) analysis of SF₆ samples (approximately 9400), 5) 2 sonic anemometers, 6) 6 mobile realtime SF₆ analyzers. Nearly the entire FRD staff will be needed to support the field deployment. (Kirk.Clawson@noaa.gov and staff)

Some discussions have taken place with ATDD regarding FRD's participation in the VTMX experiment, which is scheduled for Salt Lake City this coming October. ATDD has received funding from DOE to participate in the experiment, and intends to collect data with the Long-EZ aircraft. FRD may provide assistance in flight planning, since the nighttime operations that will be required during VTMX are similar to what was done last year during the CASES-99 experiment. (Richard.Eckman@noaa.gov, Tim Crawford)

SHOWEX99

The final data set for the SHOWEX99 experiment has been processed. Several bugs in the new DGPS correction software (FLYKIN) were fixed. Additionally, quality check flags were added to the final output for aid with data QC. A data report is being prepared and will be ready for ARL review shortly. (Jeff.French@noaa.gov, Jerry Crescenti, Tim Crawford)

Model Validation Program (MVP)

The Air Force has requested additional MVP data analysis on Session 4 data from Vandenberg Air Force Base. The Session 4 data have received relatively little attention so far, compared with the MVP data collected at Cape Canaveral. (Richard.Eckman@noaa.gov)

Cooperative Research with INEEL

INEEL Emergency Operations Center (EOC) Support

The Emergency Operations Center (EOC) was briefly activated on the afternoon of April 4, 2000 for a range fire. Someone who was traveling through the Upper Snake River Plain during that afternoon had to make an emergency stop because his car engine caught fire. When he pulled off the side of the road near the "puzzle" (i.e., the Intersection of U.S. 20, U.S. 26. and the main entrance of the INEEL), the car engine ignited the dry sage brush. To make matters worse, unusually strong

southwesterly winds of 30 to 40 mph rapidly spread the fire. Fortunately, the fire was quickly contained by fire-fighting crews. Jerry Crescenti, Kirk Clawson, and Brad Reese provided observations and short-range forecasts in support of EOC operations.

A routine drill was conducted at the EOC the next morning on April 5, 2000. The scenario involved two tornados striking the Fort St. Vrain depot near Greeley, Colorado. As the drill played out, no radioactive releases were detected from the depot; however, a site worker injured his head by falling down three steps. NOAA meteorologists (Jerry Crescenti and Jeff French) provided current observations and short-range forecasts to the Planning Support Director and other EOC members. (Jerry.Crescenti@noaa.gov, Jeff French, Kirk Clawson and Brad Reese)

On April 12, Kirk Clawson and Brad Reese participated in an EOC drill which simulated response to a vehicle accident involving hazardous chemicals on the INEEL. The same drill was repeated on April 19, 2000, with Neil Hukari and Roger Carter representing FRD in the EOC. Participating in an annual drill is part of the on going training for EOC responders. Because the scenario did not include an actual release, FRD's role was somewhat limited. The drills generally went well with a few suggestions for improvements were by the participants. (Kirk.Clawson@noaa.gov, Brad Reese, Roger Carter, and Neil Hukari)

INEEL Mesoscale Meteorological Network

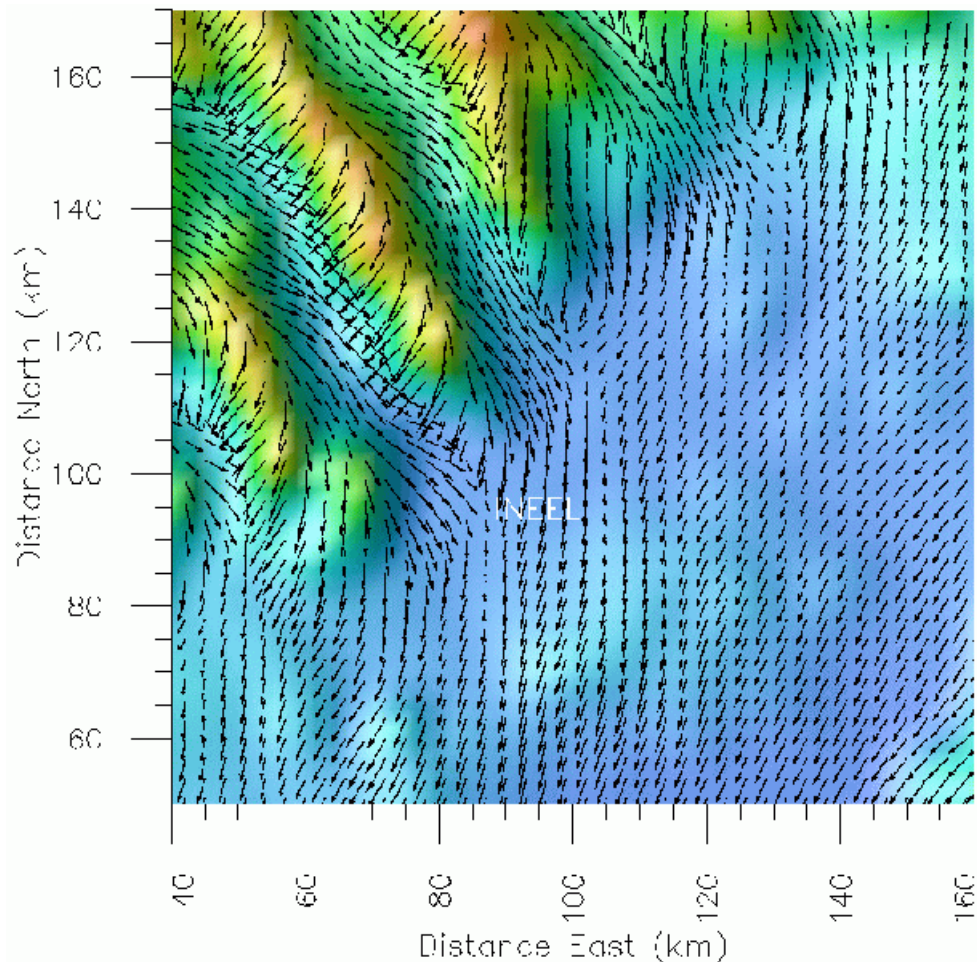
The three electric field mills were removed from winter storage and reinstalled on the INEEL this month. They will be operated throughout the thunderstorm season to help monitor development of thunderstorms around the INEEL. They are stored during the winter months to prevent damage from snow and ice build up. (Roger.Carter@noaa.gov)

For a year, we have been operating a temporary rainfall monitoring system for the Radioactive Waste Management Complex (RWMC) on the INEEL. The INEEL Stormwater Coordinator asked FRD to set up the system initially. It automatically sends a page to one member of the stormwater sampling group whenever rain is detected at RWMC. This allows them to sample the stormwater run off from the facility as required by the EPA. This month, we were requested to make the system permanent since they have been unable to find a reliable alternative. We also placed current precipitation amounts for INEEL locations on the FRD web page so they could monitor rainfall from their home computers to determine when stormwater sampling was necessary. (Roger.Carter@noaa.gov, Brad Reese)

INEEL Mesoscale Modeling

Further MM5 simulations were performed in April for the region surrounding INEEL. The current model configuration uses three nested grids having respective spacings of 27, 9, and 3 kilometers. The 27 km grid covers much of the Pacific Northwest, and the 9 km grid covers the Northern Rockies. The 3 km grid covers the Snake River Plain and surrounding mountains; it has sufficient resolution to resolve some of the flows within the tributary valleys that feed into the Snake River Plain. An example from 0800 MST on 30 March 2000 is shown below for the wind field at about 35 m AGL. (This plot shows only a portion of the model domain.) The simulation shows air

moving down several tributary valleys and then joining with the main northeasterly flow over the Snake River Plain. Two of the tributary flows exit right near INEEL. Of course, extensive comparisons with the INEEL tower observations will be required to determine whether the model simulations are realistic.
(Richard.Eckman@n
oaa.gov)



Other Activities

FRD Vision Quest Workshop

Monday, 10 April FRD held a Vision Quest Workshop. Attending were FRD staff joined by Gene Start, David George and Bruce Hicks (conference call). The workshop goal was not to review ongoing programs but to plan where FRD should focus research efforts during the next five years. The morning session focused on identification of opportunities. Climate related research was identified as the best future opportunity. The afternoon session identified how FRD could derive advantage within the identified opportunities. Proposals submitted over the last few months position FRD well to initiate new climate research. A few workshop conclusions were:

- * DOE/INEEL support must remain our top priority
- * FRD should remain the leader of tracer release and collection technology
- * New tracer analysis technology should be explored
- * A fire behavior model should be added to INELVIZ
- * Explore other uses of the powerful mesonet such as the Climate Reference Network
- * Continue development of the airborne geoscience program

Outreach

Outreach efforts continue with the State of Idaho INEEL Oversight Program and the local DOE office. Requests for help have far exceeded the capacity of the FRD budget and response has had to be curtailed. Some funding might be available from DOE outreach funds. These funds would go to

videotape presentations by meteorologists to teach portions of the *Idaho Environmental Monitoring Program Workbook*, another joint effort of FRD and Oversight that has been the subject of numerous previous outreach reports. (Kirk.Clawson@noaa.gov and Jerry Crescenti)

Proposals

Last month, we submitted three pre-proposals and were Co-PI's on two additional proposals to the Office of Naval Research's (ONR) Coupled Boundary Layers/Air-Sea Transfer research initiative. We are pleased to report ONR requested full proposals on four of the five submissions. We are especially excited that the proposal *Development and Deployment of an Extreme Turbulence (ET) Probe for Hurricane and High Wind Research* was also selected for NOAA co-funding. (Tim.Crawford@noaa.gov, Jerry Crescenti, and Randy Johnson)

Sagebrush Steppe Ecosystem Flux Site Development and Eddy Correlation and Bowen Ratio Intercomparison, by Kirk L. Clawson, Douglas A. Johnson (USDA-ARS) and Nicanor Z. Saliendra (USDA-ARS). Submitted to the U.S. Dept. of Energy Terrestrial Carbon Program.

Papers

Biltoft, Christopher A., Shayes D. Turley, **Thomas B. Watson**, **Gennaro H. Crescenti**, and **Roger G. Carter**. 2000. Final Test Report for the Over-Land Alongwind Dispersion Field Tests. Joint Contact Point Program Management Office, West Desert Test Center, U. S. Army Dugway Proving Ground, Utah, 36 pp.

Watson, Thomas B., Randy Johnson, Marc L. Pitchford, Mark Green, Hampden Huhns, and Vicken Etyemezian. In review. The Perfluorocarbon Tracer Releases During the Big Bend Regional Aerosol and Visibility Observational (BRAVO) Study. NOAA, Air Resources Laboratory, Field Research Division, April 2000, Idaho Falls, Idaho, 41 pp.

Preprints were received for the presentations made at the Application of Air Pollution Meteorology Conference held in California in January: (These have not been reported previously.)

Businger, Steven and **Randy Johnson**. 2000. Evolution in the Design of a Smart Balloon for Lagrangian Air Mass Tracking. Preprint. 11th Conference on the Application of Air Pollution Meteorology with the Air & Waste Management Association, American Meteorology Society, January 9-14, Long Beach, California, p. 321.

Clawson, Kirk L., Jerrold F. Sagendorf and Roger G. Carter. 2000. Comparisons of a Puff Trajectory Model With Real-Time Tracer Measurements. 11th Conference on the Application of Air Pollution Meteorology with the Air & Waste Management Association, American Meteorology Society, January 9-14, Long Beach, California, pp 293-298.

Crescenti, Gennaro H. and Robert A. Baxter. 2000. Sodar Based Wind Profiles as Model Inputs: Understanding the Role of Atmospheric Conditions in Assessing the Quality of the Data. 11th Conference on the Application of Air Pollution Meteorology with the Air

& Waste Management Association, American Meteorology Society, January 9-14, Long Beach, California, pp. 432-437.

Crescenti, Gennaro H., Kirk L. Clawson and Bradley R. Reese. 2000. The Idaho Environmental Monitoring Program. Preprint. The Ninth Symposium on Education, American Meteorological Society, January 9-14, Long Beach, California, pp. 28-30.

Travel

Kirk Clawson participated in the April planning meeting for the Vertical Transport and Mixing Experiment, DOE Chemical and Biological Non-Proliferation Program (VTMX-CBNP) in Salt Lake City, UT April 17-20, 2000.

Jeff French attended workshop on EPA Super Site Program in Baltimore, MD April 12-13, 2000. At the workshop, Jeff discussed the capability of the LongEZ aircraft as a platform for making upper air measurements.

Tom Strong went to California to survey test sites for the Central California Ozone Study (CCOS). Pre-test preparations were made for the eight meteorological tower sites and the upper air sounding site.

Visitors

Dr. Corey D. Schou, Associate Dean of the Idaho State University College of Business, visited the FRD facility on April 17. He met several staff members and received a brief overview of FRD activities, including the computer support of the mesonet. Idaho State University will receive (under the college and university section of the Computers for Learning Program) some HP computers that are no longer adequate for FRD needs and were scheduled for disposition.

Training

Paula Fee attended the Pre-Retirement Planning course presented by the USDA Graduate School in Boise, Idaho, on April 5-7, 2000, and Randy Johnson attended the same course in Sacramento, California on April 27-19, 200. The course covered retirement eligibility, annuity computations, survivor benefits, health and life insurance benefits, social security and medicare benefits, thrift savings plan options and income tax requirements. The information presented in the class was found to be beneficial in helping federal employees plan for retirement.

Personnel

FRD is actively recruiting for an entry-level Physical Scientist. The vacancy is now open and closes 04 April. An extensive effort has been made to publicize the vacancy locally. These efforts included publishing a help-wanted advertisement in several of the local newspapers and contacting through email department chairmen and career counseling centers of 5 of the regional universities. Our intent is to find the best local talent possible. (Kirk Clawson@noaa.gov)